Notice of Allowability	Application No.	Applicant(s)	
	10/801,981	STEWART ET AL.	
	Examiner	Art Unit	
	Bernard E. Souw	2881	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to *Amdt 07/31/2005*.

2. ☒ The allowed claim(s) is/are *1-26*.

3. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
   a) ☐ All b) ☐ Some* c) ☐ None of the:
      1. ☐ Certified copies of the priority documents have been received.
      2. ☐ Certified copies of the priority documents have been received in Application No. _____ .
      3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

   * Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.

5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
   (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
      1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
   (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.

   Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).

6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☒ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
3. ☐ Information Disclosure Statements (PTO-1449 or PTO/SB/08), Paper No./Mail Date _____
4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
5. ☐ Notice of Informal Patent Application (PTO-152)
6. ☐ Interview Summary (PTO-413), Paper No./Mail Date _____ .
7. ☐ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other _____.

DETAILED ACTION

Applicant's Amendment

1. The Amendment filed 06/07/2004 has been entered. The present Office Action is made with all the arguments being fully considered.

Claims 1-26 remain pending in this office action.

Claim Objections

2. Claims 11 and 12 having been properly amended, the previous objection is now removed.

3. The previously objected language used in claim 24 having been adequately explained, the previous objection of the claim is now removed.

Claim Rejections - 35 USC § 112 Removed

4. Claims 13 and 14 having been properly amended, the previous objections under 35 USC § 112, 2nd paragraph, are now removed.

ALLOWANCE

5. Claims 1-26 are allowed.

Reasons for Allowance

6. The following is an examiner's statement of reasons for allowance:

A charged particle beam apparatus comprising a work piece vacuum chamber for containing a work piece and having a background chamber pressure, wherein the term "background pressure" is meant as being the pressure with fill-gas being introduced into the system; a charged particle beam source; a charged particle beam optical column for directing a particle beam along an optical axis toward the work piece: a charged particle detector comprising a volume including a detector gas ionizable by the charged particles, electrodes to produce an electric field to cause the ionization to take place; and a detector plate to detect signals induced in the ionized gas, the charged particle detector including a passage for delivery of the detector gas to maintain the pressure of the detector gas around the detector sufficient to operate the detector, while maintaining the pressure in the work piece chamber (with the detector gas being introduced into the detector chamber) at a significantly lower pressure, as recited in claim 1, is neither anticipated nor rendered obvious by any prior art.

Claim 6 is allowed for reciting limitations similar to claim 1, with a modification that the detector gas ionized by the charged particles is replaced by an ion generator in which secondary particles generated by the impact of charged particle beam on a work piece or particles from the primary beam backscattered by the work piece ionize an ion producing gas, the ion generator positioned such that at least some of the ions travel to the work piece to neutralize the charge on the work piece, the ion generator including a chamber containing a gas, the chamber connected to the work piece vacuum chamber though an aperture that allows second or backscattered particles from the work piece to

enter the chamber and allows the ions to exit the chamber to neutralize the charge on the work piece, as recited in claim 6, is neither anticipated nor rendered obvious by any prior art.

Claim 9 is allowed for reciting limitations similar to claim 6, with an addition that the ion generator configured such that the ion producing gas is maintained at a sufficiently high pressure to produce sufficient ions from the secondary or backscattered particles to neutralize the charge accumulation on the work piece, while the background chamber pressure (with filling gas being introduced) remains at a significantly lower pressure.

An ion generator for controlling charge on a sample that produces second electrons as it is being worked on in a sample chamber, comprising a body having rear and forward ends and a gas inlet opening to be controllably supplied with a gas, the forward end having an aperture opening to receive the secondary electrons and emit positively charged ions; a detector electrode mounted within said body; and a channel electrode mounted within the body between the detector electrode and the aperture opening to channel the secondary electrons toward the detector electrode, the channel and detector electrodes defining an inner volume, wherein the body is configured to maintain the supplied gas at least within the inner volume at a working pressure sufficiently higher than that of the sample chamber to promote gas ionization cascades, thereby generating positively charged ions to be emitted from the inlet opening and providing an amplified secondary electron signal to the detector electrode, as recited in claim 21, is neither anticipated nor rendered obvious by any prior art.

Claims 2-5, 7, 8, 10-20 and 22-26 are also allowed because of their dependencies, either directly or indirectly, upon claims 1, 6, 9 or 21.

7. Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Relevant Prior Art

8. This prior art made of record and not relied upon is considered pertinent to applicant's disclosure:

USPAT 6,707,041, USPGPUB 2003/0010913 and USPAT 6,590,210, all three issued to Essers, disclose a charged particle beam apparatus equipped with a charged particle detector comprising a volume including a detector gas ionizable by the charged particles, electrodes to produce an electric field to cause the ionization to take place; and a detector plate to detect signals induced in the ionized gas, thus effectively generating an amplified secondary electron signal. However, being used in an environmental microscope, Essers' detector does not maintain the pressure in the work piece chamber (with the detector gas being introduced into the detector chamber) at a significantly lower pressure.

USPAT 5,986,264 issued to Gruenewald, USPAT 6,184,525 issued to Van der Mast, and USPAT 5,396,067 issued to Suzuki et al., all three disclose a charged particle

beam apparatus equipped with a charged particle detector comprising a volume including a detector gas ionizable by the charged particles, electrodes to produce an electric field to cause the ionization to take place; and a detector plate to detect signals induced in the ionized gas, thus effectively generating an amplified secondary electron signal. However, while describing an environmental microscope, none of the three references recite a detector that maintains the pressure in the work piece chamber (with the detector gas being introduced into the detector chamber) at a significantly lower pressure,

Communications

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Bernard E Souw whose telephone number is 571 272 2482. The examiner can normally be reached on Monday thru Friday, 9:00 am to 5:00 pm..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John R Lee can be reached on 571 272 2477. The central fax phone number for the organization where this application or proceeding is assigned is 571 273 8300 for regular communications as well as for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 571 272 5993.

bes
September 03, 2005

JOHN R. LEE
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2800